SA Large Herds Conference
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The theme of the 2005 SA Large Herds Conference was "Where to from here? Higher efficiency: the key to profitability". The conference offered parallel sessions catering for both Total Mixed Rations (TMR) and pasture-based dairying production systems, with speakers from South Africa, New Zealand, Australia, USA, Israel, Ireland and Scotland. The event was attended by approximately 450 dairy farmers and representatives from agricultural organisations, agricultural consultancies and provincial departments, as well as a number of international delegates from New Zealand, Australia and the USA.

Topics covered in presentations included developments in genetics research, pasture analysis techniques and interpretation of results, rumen health, optimising business performance and BEE (Black Economic Empowerment). Below are reports on two presentations that have particular relevance to the South African pasture-based dairying systems.

Management of the transition cow: mineral nutrition and altering DCAD

Dr John Roche (Dexcel, New Zealand) presented a thought-provoking paper (Roche 2005) on the management of the transition cow on pasture. Of particular interest to South African dairy farmers were Dr Roche's findings on the mineral nutrition of the dairy cow during the six-week transition period where her metabolic priorities are shifted from providing nutrition for foetal growth to milk production. Mineral supplementation of grazing dairy cows during this period is aimed primarily at preventing metabolic disorders, in particular milk fever (hypocalcaemia). Hypocalcaemia is caused by a drop in blood calcium associated with major hormonal and metabolic changes that occur at calving, including the sudden demand for extra calcium for colostrum (Mönnig & Veldman 1976). As in South Africa, the focus in New Zealand and Australia has been on the dietary concentration of calcium, magnesium, sodium, potassium, chlorine and sulphur and their effects on calcium homeostasis.

The dietary cation-anion difference (DCAD) is the difference, in millequivalents/100g DM (meq), between biologically strong cations (Na and K) and anions (Cl and S) in the diet. A reduced DCAD would, in theory, reduce blood pH. A small reduction in blood pH (e.g. from 7.42 to 7.38) has been shown to increase the calcium absorption and the amount of calcium excreted in urine. For this reason the concept of reducing precalving DCAD by feeding anionic salts has become widely recommended. In his presentation Dr Roche pointed out that a DCAD of 0meq/100g or lower is required to reduce blood pH and increase Ca absorption. This approximates to 500g to 1kg anionic salts per cow per day, depending on the original DCAD and the salts chosen. Apart from being impractical in grazing systems, feeding such amounts is potentially dangerous. There are alternative methods that are more practical in grazing systems for reducing the incidence of milk fever in a dairy herd.

Magnesium is known to be important in calcium homeostasis. Minson (1990) reported on research conducted by Young and Rys (1977) where cows supplemented with magnesium displayed a decreased incidence of milk fever. Dr Roche reported research (Roche, unpublished) showing 70% of grazing cows were hypomagnesaemic (<0.8mmol/litre) on the day of calving. Thus magnesium supplementation during the month prior to calving and during early lactation is vitally important for preventing milk fever in grazing systems. Dr Roche recommended feeding magnesium supplementation daily precalving (0.35% Mg/cow/day for a month before calving).

High dietary sulphur has also been found to decrease the incidence of milk fever. Dr Roche found that $MgSO_4$ supplementation precalving appeared to be more effective in preventing milk fever than either MgO or $MgCl_2$, even though sulphur would be regarded as a less acidifying salt than chlorine. The amounts supplemented were too small to cause a decrease in blood pH and there was no evidence of an effect on acid-base status. This suggests that sulphur may have effects on calcium homeostasis that are unrelated to acid-base biochemistry.

In summary, Dr Roche suggested that, rather than focusing on the mineral effects of anionic salts on blood pH in order to decrease the incidence of milk fever, dairy farmers would do better to minimise calcium intake precalving (feed silage or hay rather than pasture) and supplement calcium post calving (Ground limestone: 150g/cow/day). Magnesium supplementation daily both pre- and postcalving is recommended.

Key profit drivers in pasture-based dairy systems

David Beca (Red Sky Agricultural Pty Ltd) spoke on key profit drivers in pasture-based dairying. Mr Beca defined profit as the return received on the capital invested in a business. By this definition any profit ratio should refer to capital (e.g. monetary value of investment, of land or of cows). Ratios that refer to milk (e.g. costs per kilogram of milk) cannot be used as profit drivers. As levels of milk production increase, two "tipping points" are reached (See Figure 1). These are firstly a higher level of risk and then secondly a reduction in profit. In the first instance milk is not a capital item like land or cows (or the combined value of all assets) but a component of revenue. Profit ratios by definition need to refer to a unit of capital. Secondly, in pasture based dairying milk production per hectare or per cow does not have a consistent positive correlation with profit. In fact at some point the relationship becomes negatively correlated to profit.

Farm size is not a key profit driver due to the high proportion of variable costs associated with pasture-based dairying. Given there are only a small proportion of fixed costs in pasture based dairying (and most of these 'fixed' costs alter proportionately with farm size), it would be inconsistent to draw the conclusion that size of farm would provide any significant advantage. It is true that very small farms would have some disadvantages due to factors such as the impact of imputed or real management costs being spread across a small number of cows along with the fixed structural costs in dairying. However once the dairy farm is of moderate size (i.e. 150-200 cows in Australia and New Zealand) then the impact of farm size has low impact.

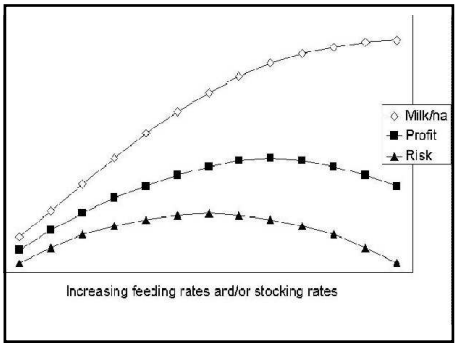

Figure 1. Relationship between Milk Production, Profit and Risk (Beca, 2005)

Mr Beca presented what he believes are the five key profit drivers applicable to pasture systems.

1. Pasture Harvest

In Australia and New Zealand, pasture is the lowest cost feed in pasture-based dairying systems. Although variable and capital costs most often boost this cost, it is usually significantly lower than the cost of any supplementary feed. The value of pasture is heavily influenced by the amount of pasture harvested per ha and as a result the most significant outcome of increasing pasture harvest is to drive down the cost of pasture and therefore the average cost of production.

2. Milk production per hectare

Increasing supplementary feeding rates to cows and/or increasing stocking rate generally lead to an increase in milk production per hectare. The response curve is curvilinear so that increasing milk production per hectare by these means generally lead to a strong positive correlation to profit when imposed on a low level of performance. Mr Beca highlighted the importance of recognising that at moderate and high levels of milk production, this correlation to profit becomes weak and then negative. This curvilinear relationship means that at some point further increases in milk production per hectare will result in a reduction in profit. He also pointed out that it is important to understand that the shape of the profit curve and the "tipping point" are farm specific. The key determinants of the shape of these curves are milk price, pasture production (or price), supplementary feed price and base cost structure.

3. Supplementary feed cost

The primary influence of supplementary feed on profit is the cost of these forages and concentrates. As with pasture this includes the purchase price (which should include any storage costs) plus the variable costs and capital costs. In addition the effects of wastage must be quantified, including both storage/bunker wastages and losses in delivery of the feed to the cows. In Australia and New Zealand, the impact of these additional costs is that the full cost of forage is usually 30% to 60% above the purchase price. The full cost of concentrates is usually 7% to 15% above the purchase price.

In the case of concentrates there is often less opportunity to produce these on farm. However, Mr Beca pointed out there can still be significant opportunities through astute purchasing decisions. In addition there are often opportunities to reduce the effective cost of concentrates through eliminating potentially excessive use of protein, minerals, trace elements and other additives.

4. Labour efficiency

After feed costs, labour costs are normally the next largest cost centre. In Australian/New Zealand pasture based dairying there are many instances where labour costs (including imputed management costs) are greater than feed costs.

Mr Beca reports that in both Australia and New Zealand the average level of performance is most commonly 90-110 cows per full time staff equivalent, with the top 10% of farms running 110-120 cows. However there is also a significant minority running 140-170 cows per full time equivalent which provides a window into a major opportunity for many farmers to lift profitability. Mr Beca believes the most critical factor in labour efficiency to be the management skills of the business owner or operator.

5. Fixed cost structure

Mr Beca reports that, when the fixed costs are compared on a per cow basis, high profit farms normally have a lower cost structure than other farms even though they will often exhibit a higher level of production.

Pasture based dairying has a high proportion of variable costs in that these variable costs normally constitute 70%-85% of operating

expenses. In a high variable cost business there are not significant opportunities to increase revenue (i.e. milk production) to "water down" the impact of high costs. Effectively businesses with a high proportion of variable costs have no alternative but to control costs if they are to be significantly profitable.

In summary, Mr Beca pointed out that, in Australia and New Zealand, the most profitable farms are those that have pasture harvest levels 15-25% above average, milk production per hectare 15-30% above average, whose supplementary feed costs are 5-20% below average, have increased labour efficiency (measured as cows milked per full time staff equivalent) to 10-30% above average and whose base cost structure per cow is 5-15% below average.

References

Beca D 2005. Key Profit Drivers: Pasture system. Proc. 2005 SA Large Herds Conference, 21-24 February, Club Mykonos, South Africa.

Minson DJ 1990. Forage in Ruminant Nutrition. Academic Press Inc., San Diego, California. pp 228

Mönnig HO & Veldman FJ 1976. Handbook on Stock Diseases. Tafelberg Publishers Limited, Cape Town. pp 236

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Young PW, & Rys G 1977. Proc. Ruakura Farmers' Conf. 29: pp 30-33.

MPO/GSSA DAIRY FARMER SYMPOSIUM

Date: 1 September 2005 · Venue: Boston Farmers Hall

Contact Details
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PROGRAMME:

09h30 - 10h00: Tea

10h00 -10h05: Welcome

Contact Details
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10h05 - 10h25: The role of commercial farmers in BEE (Carlos Boldogh, COO, KZN Department of Agriculture)

10h25 -10h50: BEE initiatives in the Eastern Cape dairy industry (Trevor Elliot)

10h50 - 11h05: Discussion

11h05 - 11h20: Break

11h20 - 11h50: Ten years of no-till maize production (Rene Stubbs)

11h50 - 12h10: No-till pasture systems (Beezy Stone and Nigel Smith)

12h10 - 12h25: Discussion

12h25 - 13h05: MPOKZN AGM

13h05 - 14h00: Lunch

After lunch: Static display of new types of pasture pleasers and the results six weeks after planting with each of the machines